Claims

1. A degassing device (201; 202; 203; 204; 205; 206) comprising:
- a first chamber (21) having an inlet for a liquid; and
- a second chamber (22) having an opening (23) closed by a hydrophobic membrane (24) and an outlet (25) for discharging the liquid,
wherein the first chamber (21) has a downstream portion that partially extends within the second chamber (22) and communicates therewith by a passageway (28), and the second chamber (22) has a downstream portion that extends below the passageway (28) and asymmetrically surrounds the downstream portion of the first chamber (21).

2. A degassing device (201; 202; 203; 204; 205; 206) according to claim 1, wherein the downstream portion of the second chamber (22) has a lateral wall (29; 62) that surrounds a longitudinal axis (27) of the degassing device and a bottom wall (30; 60) that is inclined with respect to a longitudinal axis (27) of the degassing device.

3. A degassing device (201; 202; 203; 204; 206) according to claim 2, wherein the downstream portion of the first chamber (21) has a lateral wall (26) that is concentric to the lateral wall (29) of the second chamber (22).

4. A degassing device (201; 202; 203; 204; 206) according to claims 3, wherein the lateral wall (26) of the downstream portion of the first chamber (21) and the lateral wall (29) of the downstream portion of the second chamber (22) are substantially cylindrical.

5. A degassing device (201; 202; 203; 204; 206) according to one of the claims 1 to 4, wherein the downstream portion of the first chamber (21) has a cross-section that is substantially the same as the cross-section of the passageway (28) between the first and the second chamber (22).

6. A degassing device (205) according to one of the claims 1 and 2, wherein the downstream portion of the first chamber (21) is substantially conical and the

passageway (28) between the first and the second chamber (22) opens at the tip of the cone.

7. A degassing device (205) according to claim 6, wherein the passageway (28) between the first and the second chamber (22) opens in the second chamber (22) close to a wall (62) delimiting an upstream portion of the second chamber (22).

8. A degassing device (201; 202; 205) according to one of the claims 1 to 7, wherein the first chamber (21) comprises an upstream portion having a decreasing cross section.

9. A degassing device (203; 204) according to one of the claims 1 to 7, wherein the first chamber (21) comprises an upstream portion having an increasing cross section.

10. A degassing device (201; 202; 203; 204; 206) according to one of the claims 1 to 9, wherein the second chamber (22) comprises an upstream portion extending above the passageway (28) that has a decreasing cross-section, with a larger cross-section that is substantially level with the passageway (28) and a smaller cross-section that is substantially level with the hydrophobic membrane (24).

11. A degassing device (201; 202; 203; 204) according to claim 10, wherein the upstream portion of the second chamber (22) is substantially frusto-conical.

12. A degassing device (201; 202; 203; 204; 205; 206) according to one of the claims 1 to 11, wherein the outlet port (25) opens in the downstream portion of the second chamber (22) at a location furthest to the passageway (28).

13. A degassing device (201; 202; 203; 204; 205; 206) according to one of the claims 1 to 12, wherein the ratio of the diameter of the passageway (28) to the diameter of the second chamber (22) at the level of the passageway (28) is comprised between about 0,2 and about 0,5.

14. A degassing device (201; 202; 203; 204; 205; 206) according to one of the claims 1 to 13, wherein the first chamber (21) of the degassing device has a downstream portion having a cross-section selected with respect to a maximal flow rate of a liquid in a circuit connected to the degassing device so that the velocity of the liquid in the downstream portion of the first chamber (21) is less than a predetermined velocity.

15. A degassing device (201; 202; 203; 204; 205; 206) according to claim 14, wherein the cross-section of the downstream portion of the first chamber (21) is selected with respect to a maximal flow rate of a liquid of about 500ml/min in a circuit connected to the degassing device so that the velocity of the liquid in the downstream portion of the first chamber (21) is less than about 3m/min.

16. A degassing device (201; 202; 203; 204; 205; 206) according to one of the claims 1 to 15, wherein the cross-section of the second chamber (22) of the degassing device at the level of the passageway (28) is selected so that the ratio of the velocity of a liquid within a downstream portion of the first chamber (21) to the velocity of the liquid within the second chamber (22) at the level of the passageway (28) is more than a determined value.

17. A degassing device (201; 202; 203; 204; 205; 206) according to claim 16, wherein the cross-section of the second chamber (22) of the degassing device at the level of the passageway (28) is selected so that the ratio of the velocity of the liquid within the downstream portion of the first chamber (21) to the velocity of the liquid within the second chamber (22) at the level of the passageway (28) is at least about 2.

18. A degassing device (201; 202; 203; 204; 205; 206) according to one of the claims 1 to 17, wherein the downstream portion of the second chamber (22) forms an overflow for a fluid flowing from the first chamber (21) into the second chamber (22).

19. A degassing device (201; 202; 203; 204; 205; 206) according to one of the claims 1 to 18, wherein the first chamber (21), the second chamber (22) and the

passageway (28) therebetween are arranged with respect to each other so that a flow pattern of a liquid flowing from the first chamber (21), through the second chamber (22) and to the outlet port (25) comprises a component that is tangential to the membrane.

20. A degassing device (201; 202; 203; 204; 205; 206) according to claim 19, wherein the flow pattern of a liquid flowing from the first chamber (21), through the second chamber (22) and to the outlet port (25) comprises an umbrella like component.

21. A degassing device (201; 202; 203; 204; 205; 206) according to one of the claims 1 to 20, wherein the first chamber (21), the second chamber (22) and the passageway (28) therebetween are arranged with respect to each other so that a flow of liquid flowing from the first chamber (21), through the second chamber (22) and to the outlet port (25) keeps gas bubbles in motion along an inner surface of the hydrophobic membrane (24).

22. A degassing device (201) according to one of the claims 1 to 21, further comprising an inlet port (38, 39, 40) for the infusion of liquid.

23. A degassing device (201) according to one of the claims 1 to 22, further comprising a pressure measurement port (38, 39, 40) for connection to a pressure sensor.

24. A degassing device (201; 202; 203; 204; 205; 206) according to any of the claims 1 to 24, further comprising a protective member (36, 44, 59, 63, 77) for protecting the hydrophobic membrane (24) against external blows and for limiting the deformation of the hydrophobic membrane (24) when the pressure of the liquid within the degassing device exceeds a limit.

25. A degassing device (201; 202; 203; 204; 205; 206) according to one of the claims 1 to 24, wherein the hydrophobic membrane (24) is arranged in a plane substantially perpendicular to a longitudinal axis (27) of the degassing device.

26. End-cap assembly for a filtration device (1) including a filtration membrane (4) arranged in an elongated housing (2), the end-cap assembly comprising:

- an end-cap (5; 50) having:
  - an end wall (15; 51) having a central axis,
  - a peripheral wall (16; 52; 61; 71) surrounding the end wall (15; 51), for connection to an end of the housing (2), and
- a degassing device (201; 202; 203; 204; 205; 206) according to one of the claims 1 to 25 connected to the end-cap (5, 50) so that the first chamber (21) of the degassing chamber is in fluid communication with an interior of the en-cap.

27. End-cap assembly according to claim 26, wherein the degassing device (201; 202; 205; 206) has a longitudinal axis (27) that coincides with the central axis of the end wall (15; 60) of the end-cap (5) and the first chamber (21) has a wall (26; 60; 72) directly connected to the end wall (15; 60) of the end-cap (5).

28. End-cap assembly according to claim 27, wherein the end wall (15) of the end-cap (5) is substantially annular and the wall of the first chamber (21) has circular cross section decreasing from a first end of larger section, by which the first chamber (21) is connected to the end wall (15) of the end cap (5), to a second end of smaller cross section forming the passageway (28) between the first chamber (21) and the second chamber (22).

29. End-cap assembly according to claim 26, wherein the degassing device (203) has a longitudinal axis (27) that is substantially parallel to and spaced apart from the central axis (3) of the end wall (51) of the end-cap (50), and the end cap assembly further comprises a lateral nozzle (53) for connecting an interior of the end-cap (50) to an inlet (54) of the first chamber (21) of the degassing device (203).

30. End-cap assembly according to claim 29, wherein the first chamber (21) has a wall having circular cross section increasing from a first end of smaller section, which forms the inlet (54) of the first chamber (21), to a second end of larger cross section, which forms the passageway (28) between the first and the second chamber (22).

31. Filtration device (1) comprising an end-cap assembly according to one of the claims 26 to 30.

32. Filtration device (1) according to claim 31, for the extracorporeal treatment of blood.